

1970

**OPERATING
SUMMARY**

ELORA

***water pollution
control plant***

TD
227
E467
W38
1970

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RESOURCES COMMISSION

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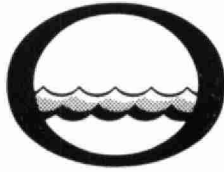
Division of Plant Operations

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Water management in Ontario

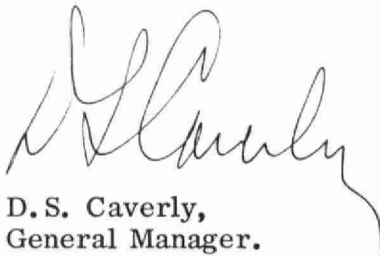
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario


Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D.S. Caverly,
General Manager.



D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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ELORA
water pollution control plant

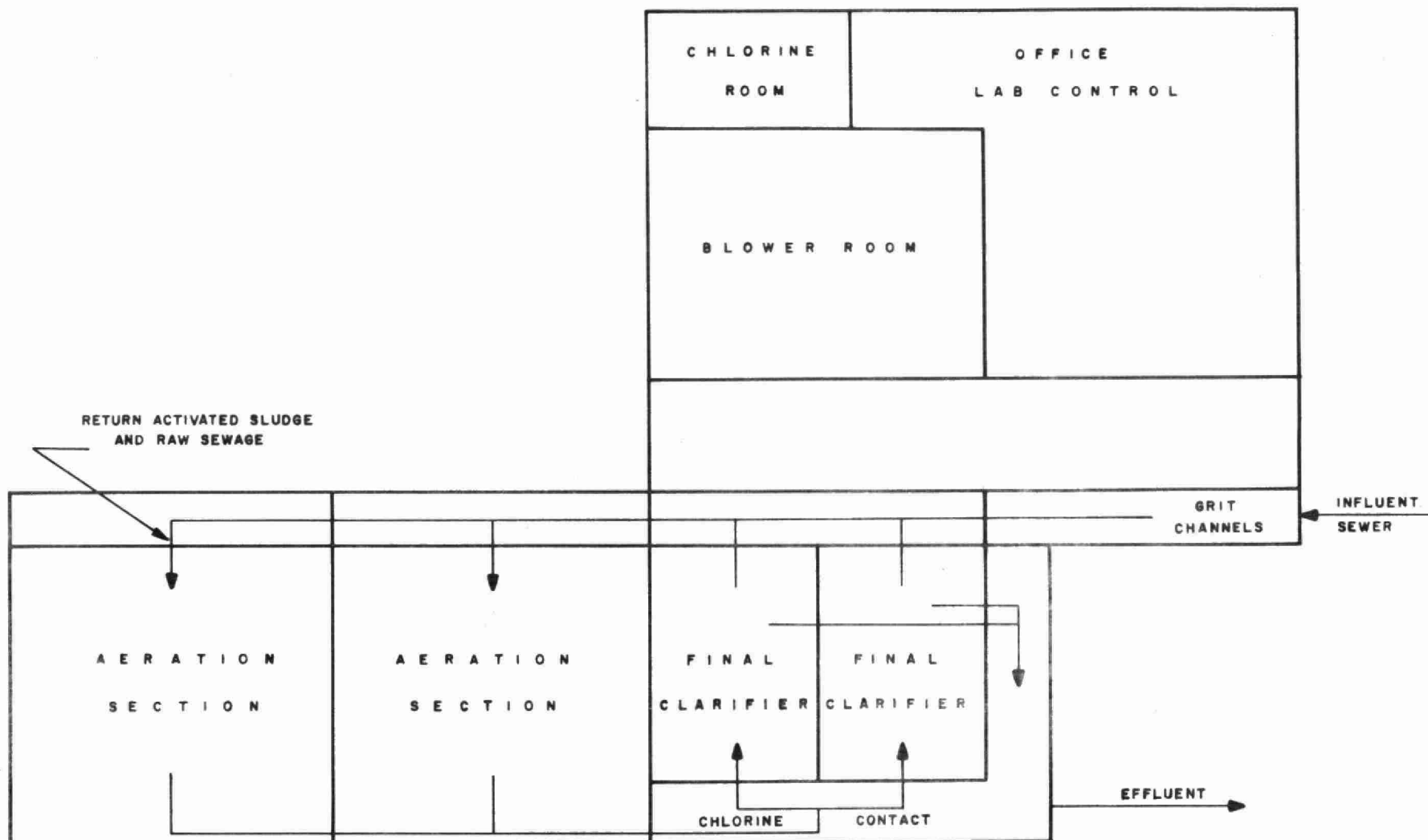
operated for

THE VILLAGE OF ELORA

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY



ELORA WPCP
FLOW CHART

DESIGN DATA

PROJECT NO.	2-0125-62	TREATMENT	Extended Aeration
DESIGN FLOW	0.083 mgd	DESIGN POPULATION	1,000
BOD - Raw Sewage	210 mg/l	SS - Raw Sewage	250 mg/l

PRETREATMENT

Screening (at pumping station)

- Two coarse bar screens

Pumps - Robert Morse

- Two 300 gpm (electric) @ 47' tdh

Grit Removal

Type: Grit channels

Size: Two 10' x 2'

SECONDARY TREATMENT

Aeration Tanks

Type: Single-pass

Size: Two 32' x 20' x 11' (14,100 cu ft
or 87,800 gal)

Retention: 25.4 hr

Air Supply

Type: Sutorbilt; variable speed pulley

Size: Two 183-370 cfm each

Diffusers

Type: Spargers

Size: 16 per tank @ 2' centres

Secondary Sedimentation

Type: Walker Process

Size: Two 26' x 6' x 7'9" deep (7,500 gal)

Retention: 4.3 hr

Loading: Surface, 266 gal/ft²/day

Weir, 1,500 gal/ft/day

CHLORINATION

Type: Advance, Model 101

Chlorine Contact Chamber

Size: 13' x 5' x 6' deep (2,180 gal)

Retention: 37.7 min

OUTFALL

- 12" dia pipe to Grand River

SLUDGE HANDLING

Type: Thickening tank

Size: 27' x 20' 8" x 11' 9" (avg)
(6,750 cu ft or 42,000 gal)

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	.11	—	39.0	—
High	.15	October	4.7	December
Low	.05	January	.6	January

GENERAL

The average daily flow of 0.07 mg exceeded the design flow of 0.083 mg 33% of the time. The BOD and suspended solids reductions were both 96%. A total flow of 23.8 mg was treated at a cost of \$7,746.20.

A review of the need for expansion of the Elora Water Pollution Control plant to handle the increasing flows is being conducted by the Division of Plant Operations.

During the year, both the Elora and Fergus Water Pollution Control plants were operated by plant staff stationed at Fergus. Under the supervision of head office engineers, the staff operated a clean, attractive and very efficient plant for the Village of Elora.

PLANT FLOWS and CHLORINATION

An average chlorine dosage of 5.5 mg/l was required to maintain a chlorine residual of 0.5 mg/l.

PLANT EFFICIENCY

The average BOD and suspended solids concentrations in the influent were 190 and 263 respectively mg/l. The effluent BOD and suspended solids concentrations of 6 and 10 mg/l were well within the OWRC objectives of 15 mg/l for each. Removal efficiencies were both 96%.

AERATION

The average MLSS concentration of 5400 and F/M ratio of 0.03 are within the limits of good extended aeration for Elora.

CONCLUSIONS

Without the aid of a polyelectrolyte the Elora Water Pollution Control plant would fail to produce a good effluent. The polyelectrolyte is employed as a sludge settling agent to maintain the sludge blanket at an acceptable level. With the gradual increasing flows it is hoped that the Elora plant will be able to continue to produce its characteristic clean, sparkling effluent by increasing dosages of polyelectrolyte.

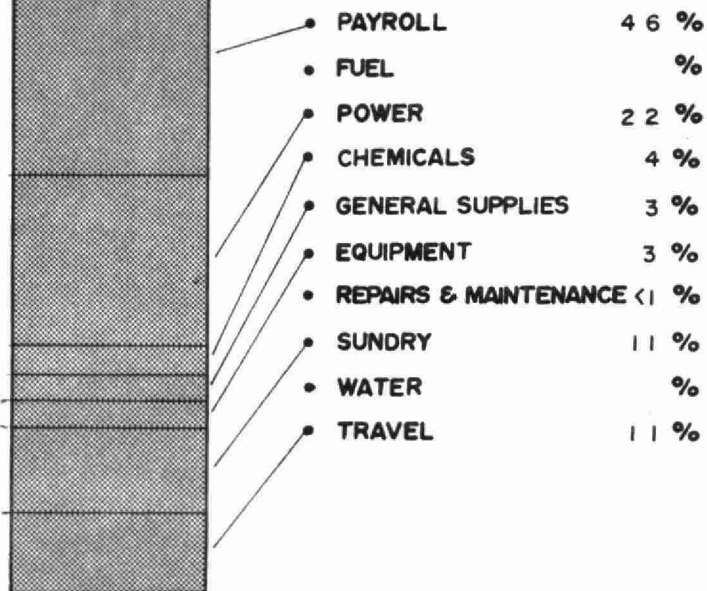
PROJECT COSTS

NET CAPITAL COST (Final)	\$361,285.04
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>163,655.86</u>
Long Term Debt to OWRC	<u>\$197,629.18</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	\$ <u>31,787.61</u>
Net Operating	\$ 7,746.20
Debt Retirement	3,988.00
Reserve	1,697.78
Interest Charged	<u>11,072.42</u>
TOTAL	\$ <u>24,504.40</u>

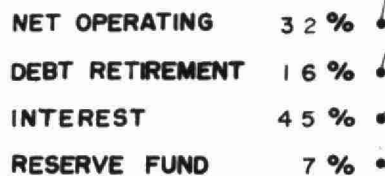
RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 12,779.14
Deposited by Municipality	1,697.78
Interest Earned	<u>866.40</u>
	\$ 15,343.32
Less Expenditures	<u>-</u>
Balance @ December 31, 1970	\$ <u>15,343.32</u>

1970 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	18.13	\$6,508.59	\$358.76	16 cents
1967	23.57	6,370.25	270.24	12 cents
1968	29.29	7,647.34	261.09	19 cents
1969	24.8*	5,743.38	231.59	17 cents
1970	23.8	7,746.20	325.40	16 cents

* Estimated

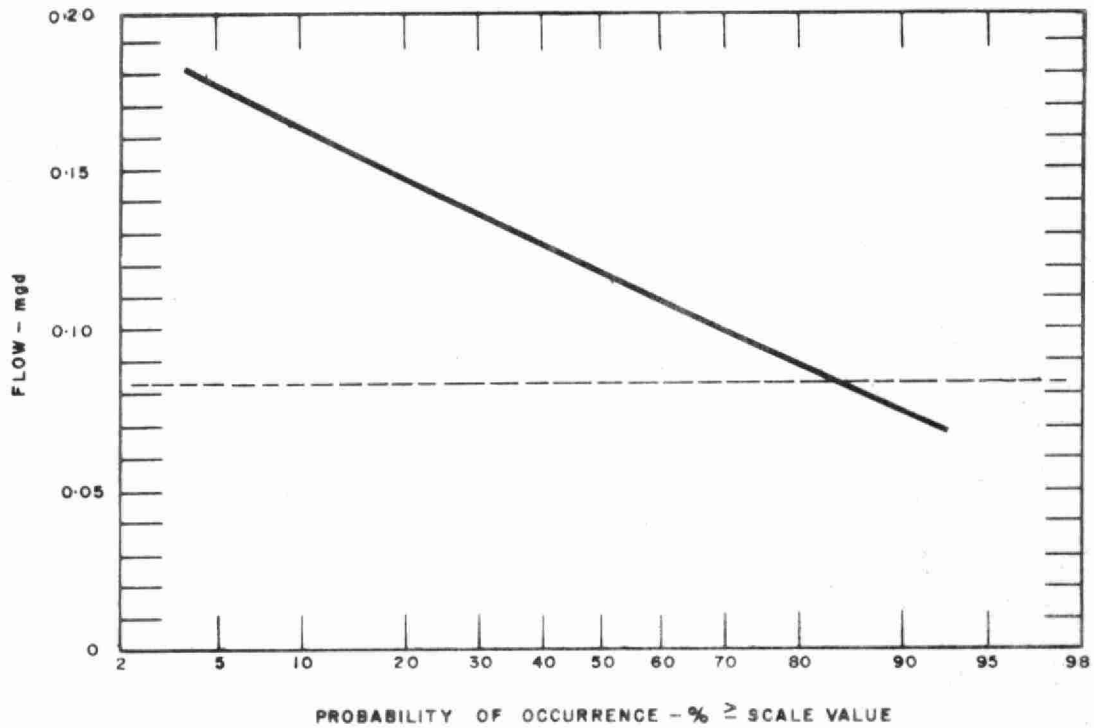
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	459.70	228.54	-	-	156.75	-	-	-	-	12.01	-	62.40
FEB	520.21	255.91	-	-	146.62	-	27.42	14.65	-	12.01	-	63.60
MAR	468.89	240.40	-	-	139.87	-	20.21	-	-	12.01	-	56.40
APR	525.00	284.05	-	-	163.51	-	-	-	-	16.24	-	61.20
MAY	511.67	255.06	-	-	158.41	-	24.99	-	-	12.09	-	61.20
JUNE	577.68	-	-	-	136.20	-	63.45	15.00	33.26	268.57	-	61.20
JULY	823.85	282.00	-	-	123.00	57.09	4.99	-	-	294.37	-	62.40
AUG	1001.76	771.60	-	-	96.00	-	22.45	-	-	31.31	-	80.40
SEPT	680.37	338.34	-	-	127.50	-	18.68	-	-	137.65	-	58.20
OCT	439.96	9.07	194.03	-	120.00	-	25.02	-	17.00	13.64	-	61.20
NOV	851.62	305.19	-	-	150.00	284.29	14.58	-	-	32.76	-	64.80
DEC	885.49	331.79	-	-	165.00	-	41.84	209.62	-	13.64	-	123.60
TOTAL	7746.20	3301.95	194.03	-	1682.86	341.38	263.63	239.27	50.26	856.22	-	816.60

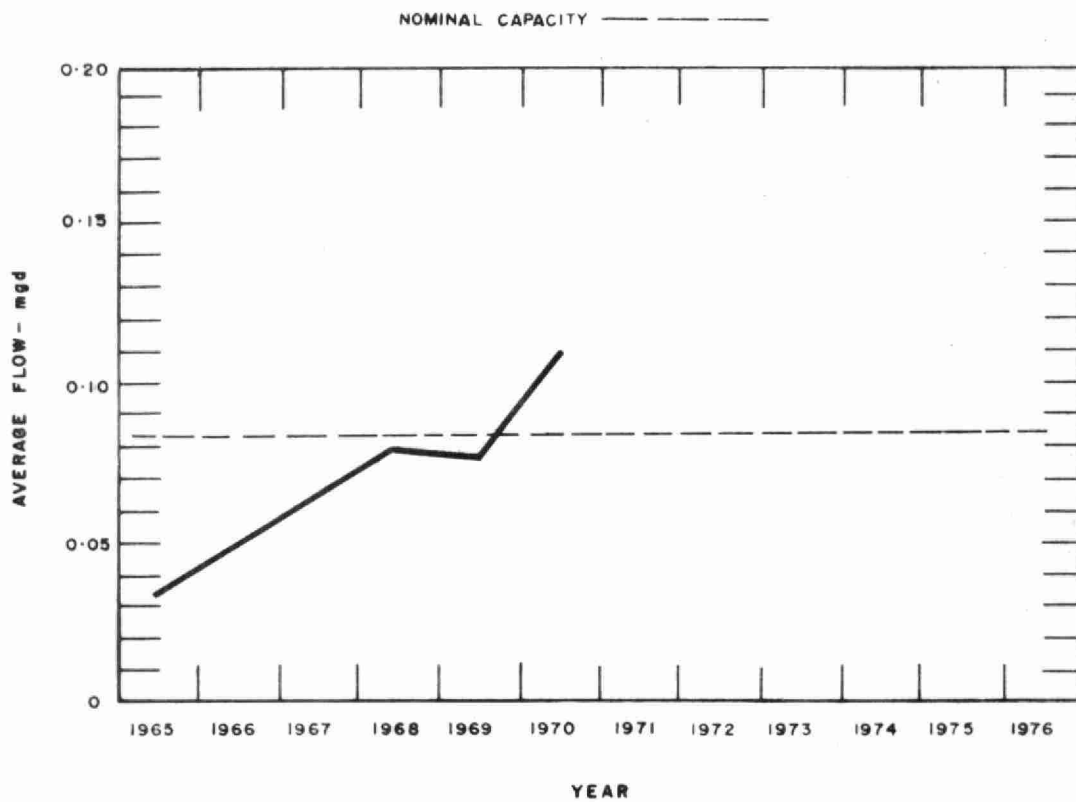
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE

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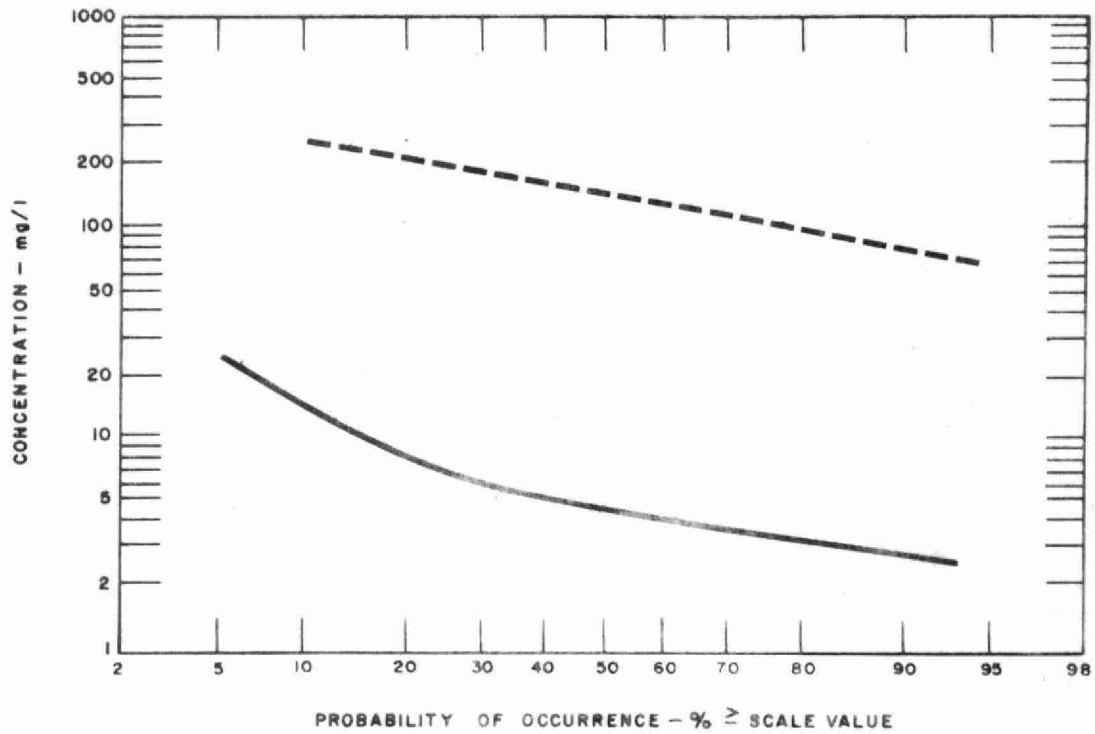


FLAWS

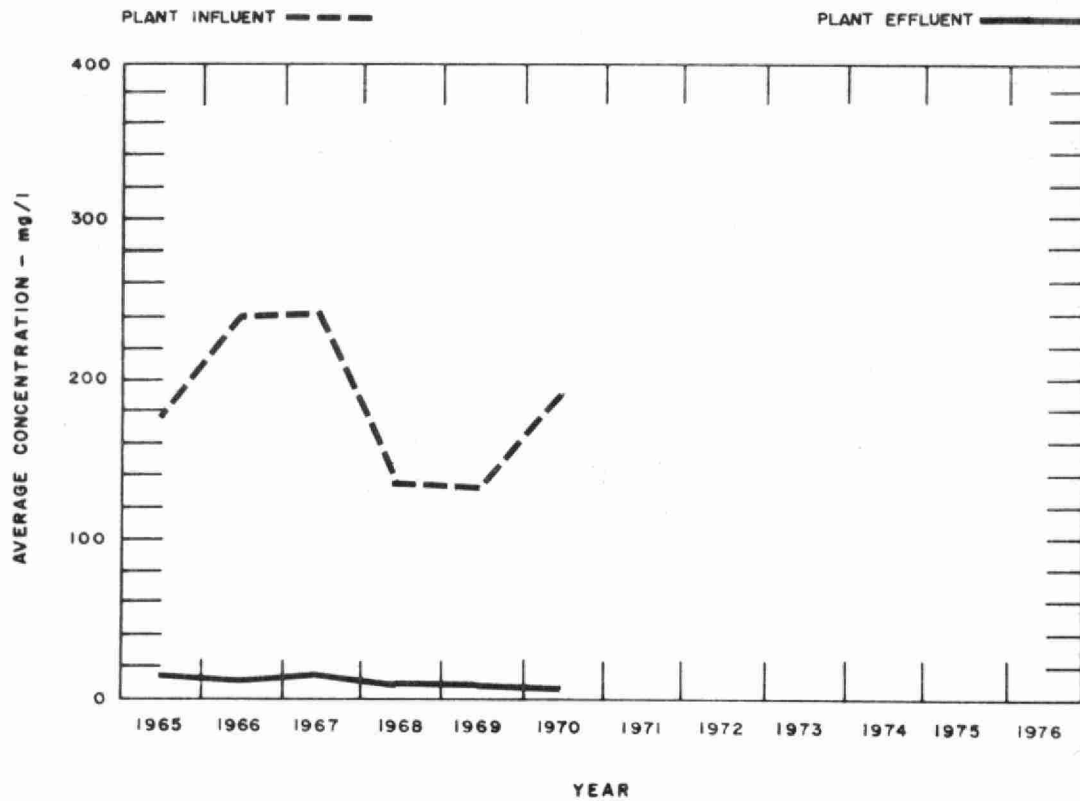


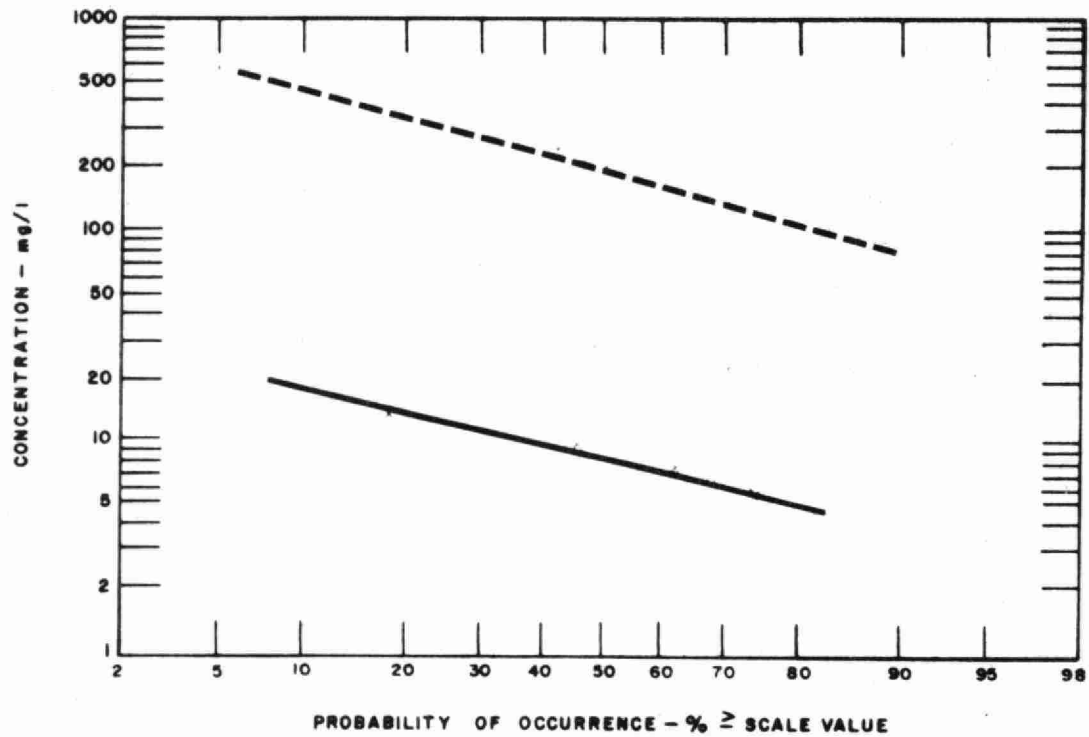
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	.6	.05	.05	.03	130	7.4
FEB	1.5	.06	.07	.04	80	5.4
MAR	2.2	.07	.12	.03	120	5.3
APR	2.3	.08	.22	.03	80	3.3
MAY	2.2	.07	.16	.08	130	5.9
JUNE	1.5	.05	.13	.07	170	11.3
JULY	1.6	.05	.14	.04	100	6.3
AUG	1.8	.06	.18	.06	80	4.5
SEPT	2.8	.09	.16	.07	170	6.0
OCT	2.1	.07	.20	.16	100	4.9
NOV	2.4	.08	.22	.07	80	3.3
DEC	2.8	.09	.21	.10	80	2.9
TOTAL	23.8	-	-	-	1320	-
AVERAGE	-	.07	.22	.03	-	5.5

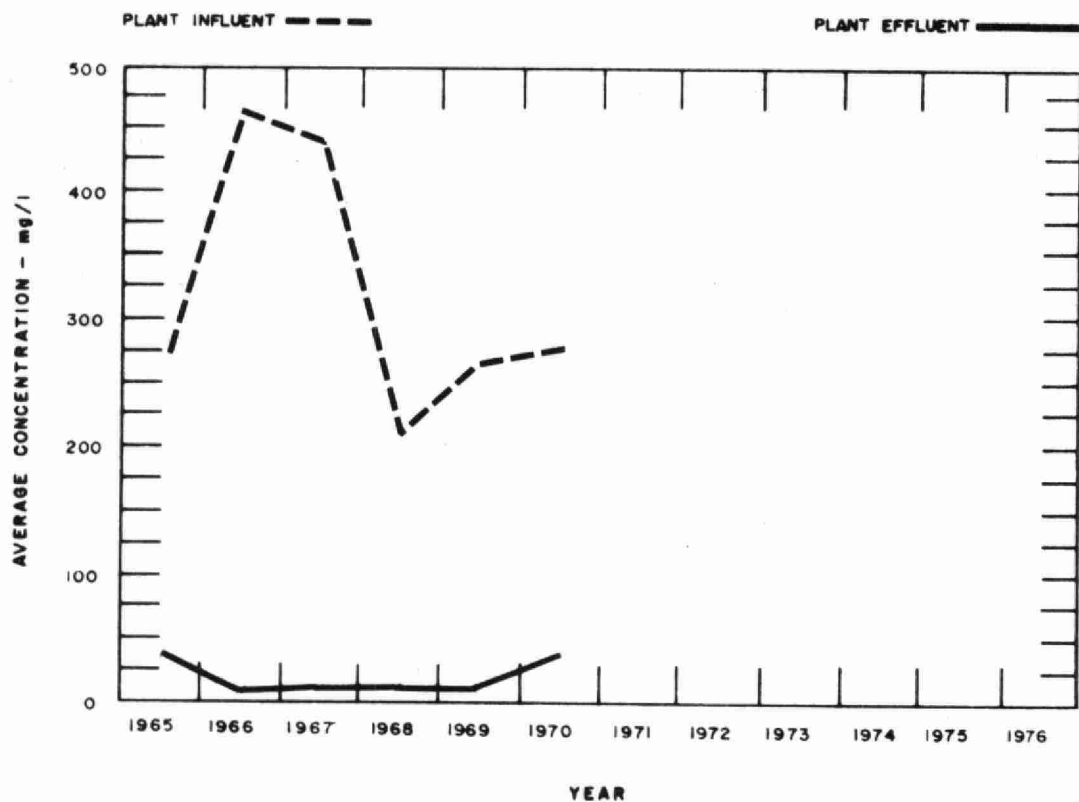


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	2	180	2	4	98	-	5	214	2	10	95	-	4
FEB	2	250	2	4	98	3.8	6	274	6	7	97	4.2	4
MAR	2	158	2	6	96	3.4	5	234	5	9	96	5.1	-
APR	2	385	2	3	99	6.5	6	205	6	9	96	4.7	8
MAY	2	105	2	3	97	2.3	6	221	6	9	96	4.8	4
JUNE	2	198	1	22	89	2.9	7	320	2	10	97	4.7	3
JULY	7	174	-	-	-	3.0	6	259	-	-	-	4.1	3
AUG	1	170	4	4	96	3.1	3	188	1	10	95	3.4	8
SEPT	1	190	1	4	98	5.3	5	326	1	5	98	9.1	-
OCT	3	193	1	10	95	4.1	7	250	1	15	94	5.3	4
NOV	7	147	1	11	92	3.3	12	237	1	20	92	5.6	-
DEC	2	263	1	16	94	7.3	8	373	1	10	97	10.4	4
TOTAL	33	-	19	-	-	-	76	-	9	-	-	-	42
AVERAGE	-	190	-	6	96	4.1	-	263	-	32	96	5.6	-

NOTE - n is the number of samples taken

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE lb/DAY
		BOD	SS	BOD	SS				
		mg/l	mg/l	mg/l	mg/l				
JAN	.05	180	214	4	10	5500	.02	4.0	-
FEB	.06	250	274	4	7	4600	.03	2.2	-
MAR	.07	158	234	6	9	5600	.02	2.7	-
APR	.08	385	205	3	9	3400	.10	1.0	-
MAY	.07	105	221	3	9	4700	.02	4.1	-
JUNE	.05	198	320	8	16	5600	.02	3.1	-
JULY	.05	0	0	20	12	5400	.03	3.4	-
AUG	.06	0	0	0	12	7600	.02	3.1	-
SEPT	.09	0	0	0	13	6800	.04	1.7	-
OCT	.07	5	12	131	114	6400	.07	10.1	-
NOV	.08	48	10	17	8	5100	.01	8.2	-
DEC	.09	7	5	-	58	4200	.03	5.0	-
TOTAL	-	18	41	17	58	-	-	48.6	-
AVERAGE	.07	151	213	22	21	5400	.03	4.0	-

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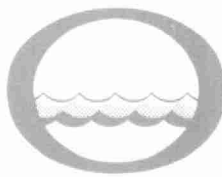
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